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The Nature Conservancy in California: Building on Success

by Steve McCormick
Director, California Field Office

IN 1958 a small band of dedicated volunteers successfully concluded protracted negotiations to acquire 4,000 acres of old-growth Douglas fir forest and an undisturbed tributary watershed of California's Eel River. The site became known as the Northern California Coast Range Preserve (NCCRP), The Nature Conservancy's first preserve in the state. Important as it was in protecting pristine habitat, the sanctuary may have had an even more significant purpose: it established the Conservancy in California.

After creation of the NCCRP, volunteer land acquisition activity quickly expanded, thanks to increasing efforts from a fledgling professional staff at the Conservancy's Western Regional Office in San Francisco. The result was a growing list of preserves, among them Elkhorn Slough, Cold Creek Canyon, and the McCloud River Preserve. Confidence grew with each achievement, and by 1977 the Conservancy was ready to take on what at the time seemed a near impossible task—the \$1.8 million Landels-Hill Big Creek project. Yet in less than a year, working with the University of California, the Conservancy had completed the fund-raising campaign to save Big Creek.

By then the escalating number and size of projects required the full-time attention of professional staff. The California Field Office was formed in 1977. With new staff—and strengthened by the unprecedented success of Big Creek—the Conservancy readied itself for an even greater challenge: Santa Cruz Island. Again the Conservancy succeeded beyond its expectations. By the end of 1979 the organization had capped off a \$4-million campaign, and the future of the 62,000-acre island was secured.

To ensure that subsequent projects would be of the same biological quality as that of Santa Cruz, the Conservancy began work with the state's Department of Fish and Game to create the California

Natural Diversity Database (now called the California Natural Heritage Section), a computer-based inventory of rare and threatened species and natural communities. Using preliminary information gathered by this heritage program, the Conservancy boldly launched the California Critical Areas Program, a three-year, \$15.5-million enterprise to safeguard the state's 11 most endangered biological communities. By the end of 1983, the California Field Office had attained its goal of 11 "critical area" sanctuaries embracing 16,000 acres—habitat for 54 rare species or natural systems. Among the lands protected were Ring Mountain, Kaweah Oaks, Baldwin Lake, Paine Preserve, Kern River, Flying M Ranch, Big Morongo Canyon, and Santa Rosa Plateau.

Purchased in the final hours of 1983, the Santa Rosa Plateau typifies the acquisitions made possible by the California Critical Areas Campaign. This mosaic of natural communities includes Englemann oak woodland and savanna, vernal pools, riparian woodland, and expanses of native bunchgrass. Its vernal pools' distinctive flora boasts three plant species endangered in the state: California orcutt grass, thread-leave brodiaea, and San Diego coyote thistle. The rare Stephen's kangaroo rat is also a Santa Rosa resident.

THE HISTORY of the Conservancy in California has followed a logical, burgeoning progression. After completing relatively small individual projects, the organization gained confidence in undertaking single large acquisitions, like Santa Cruz Island. Then the California Critical Areas Program proved that it could do equally well in protecting a large group of selected areas. Finally, the Coachella Valley venture (described on page 21), demonstrated that the California Field Office could tackle projects of enormous complexity and financial magnitude. Now, bolstered by these experiences and guided by the extensive findings of the California Natural Heritage Section, the field office is initiating its most comprehensive and ambitious statewide effort to date—Wild California.

Embracing more than 3,800 acres of pristine wilderness, Big Creek inspired the California Chapter to launch its first big state-wide fund-raising effort.

The Wild California program has two vital objectives: first, to preserve the state's most threatened endemic species and natural communities and, second, to research why species are in decline and to restore habitats in conservation ownership. The program also will establish permanent mechanisms that will provide the best means of safeguarding other imperiled biological features as they are identified. A significant aspect of the program will be extensive cooperation and coordination with public agencies and other private organizations, which will greatly expand the Conservancy's effectiveness. Sites will be protected using the most appropriate of three approaches: outright acquisition, public agency collaboration, and land-owner notification.

Outright acquisition of land is perhaps the Conservancy's hallmark. It will be a major part of the Wild California program, used to preserve areas facing imminent threats, such as parts of the Carrizo Plain in the San Joaquin Valley (see page 22).

Meanwhile, the Conservancy will collaborate with public agencies to protect sites not immediately in jeopardy. In addition to "pre-acquiring" lands for transfer to these agencies, the Conservancy will facilitate and increase the expenditure of public funds targeted for land acquisition by assisting in the execution of property appraisals, environmental assessments, and land exchanges. It also will





Three California "critical areas" protected by the Conservancy: A white beach sets off blue and gray reflections in Baldwin Lake (lower left). Bighorn sheep descend into Big Morongo Canyon for water (top left). In winter, vernal pools flood; as water evaporates, concentric rings of flowers appear, as shown above at Santa Rosa Plateau.

work with legislative bodies to help generate more public funds for land acquisition through such new sources as bond issues and development mitigation fees.

To protect areas supporting only one or a few rare biological elements not immediately threatened, the Conservancy will establish a registry or landowner notification program. Through this effort, it will secure commitments from landowners to voluntarily preserve the uncommon natural features found on their properties. Such programs, now active in 25 other states, have spelled protection for more than 1,500 sites—at virtually no cost to the Conservancy.

Through the Wild California program the Conservancy also will develop active management and research projects for protected areas. Some of the procedures already being planned include prescribed burning to regenerate native prairie grasses, reforestation of riparian corridors, and reintroduction of rare and endemic plant species. As with land protection, the Conservancy will strive to increase and expand management and research projects by working closely with government agencies and

private organizations. And by entering into cooperative agreements the Conservancy will help direct public funds toward the management of natural areas.

Wild California is planned as a four-year, \$20-million campaign. Half of this amount will be used for lands needing immediate protection and/or management and for funding of the landowner notification program. The other half will go toward purchasing high priority sites that ultimately will be sold to government agencies. As this latter \$10 million is "recaptured" through the resales, it will be continuously reinvested in additional acquisitions for public agencies.

This *News* sets the stage for the Conservancy's Wild California program. The issue not only celebrates many of our successful preservation efforts but also presents an overview of California's vast ecological riches—irreplaceable treasures that will be lost if we do not continue to set the best of them aside. But with the support of our members, this new statewide public and private cooperative endeavor may well guarantee protection for California's rarest native species and ecosystems.

California Riches

by Sheridan Warrick

IT HAS ALWAYS BEEN the golden state. Even before the legions of miners came streaming across the continent, gold had melded with the image of California.

In the 1840s, as the first American immigrants struggled over the Sierra Nevada, gold was the color of the land they found: the dried grasses of the Great Central Valley and the rolling hills above the coast. Deep gold was the color of the maple leaves, oak duff, and fallen pine needles that in autumn carpeted the floors of foothill canyons. And in spring, after the winter's rains, bright gold was the color of poppy fields that bloomed and rebloomed, illuminating whole valleys.

But gold, of course, and the promises of riches beyond hope, burst from naturalistic image to tantalizing reality with a single discovery in 1848. Suddenly, within just seven years, the region's non-native population jumped from 7,000 to 224,000. And that did it. California became forever a land that would glitter and beckon—a land of hyperbole and, some say, excess.

The forty-niners had just begun their digging when the region's few scientists began to crow about the riches *they'd* unearthed. Meeting in San Francisco to found a research society, the California Academy of Sciences, the pioneering scholars recorded their astonishment at the "rare and rich productions" of nature they saw around them: "We have on this coast...a field of richer promise in the department of natural history in all its variety than had previously been discovered."

Theirs was a bold statement, a boast really—one that now seems perfectly characteristic of the time and place. But in the 13 decades since the statement was issued, thousands of studies have proved that if anything the naturalists were understating their case. California, we have learned, has the greatest species richness, the greatest ecological

diversity, and the highest rate of endemism of any region in the continental United States.

Species richness? An inventory of the state's rare plants puts it this way: more than "5,000 plants are native, a number that is higher than that for the entire northeastern U.S. and Canada, an area ten times larger than California."





California poppies

Ecological diversity? The pie can be sliced many ways, but just to keep watch over the state's animals, the fish and game department must recognize 178 *major* habitat types, from coastal salt marsh to alpine fell field. Staff of the California Natural Heritage Section (a state heritage program) cut the pie more carefully and recognize somewhere around

300 natural communities. And as they look more closely, the number keeps going up.

Rate of endemism? At least a third of all the plants native to California are endemic—that is, they occur naturally nowhere else on Earth. Among the animals, at least 50 percent of the combined totals of species and subspecies are not found

outside the state. It is these endemics that increasingly end up on the growing lists of rare and endangered species crying for protection.

IF THE MEN who drew the state boundaries had set out deliberately to create a unique and highly diverse republic of plants and animals, they could not have done a much better job. Natural and political boundaries rarely align—political borders traditionally carve right through the middle of watersheds—but in California, for a change, something went right.

By accident as much as by design the state's founders circumscribed a terrain of enormous variety: with their single act they captured four major mountain ranges (the highest reaching 14,000 feet), two watersheds each larger than New Hampshire, innumerable rivers and lakes (including a couple of saline ones), a thousand miles of seacoast, several good-sized islands offshore, two dormant volcanoes, and large portions of three distinct deserts. Most important, however, they corralled almost all of a huge biotic assemblage that has since come to be called the California Floristic Province.

No need to flinch at the high-blown term. The California Floristic Province is simply a botanist's name for the landscape most people envision when they think of wild California: up north are the giant redwoods, hemmed in between the mountains and the coast; on the east is Yosemite Valley, Lake Tahoe, and the rest of John Muir's beloved Sierra Nevada; in the middle is the Great Central Valley, once a vast sea of grasses and marshes, now mostly given over to agriculture; and to the south are the estuaries and chaparral-covered mountains around Los Angeles and San Diego.

The province does, in fact, have clear natural boundaries. It is often described by the state's biologists as the part of California that's "cismontane"—on this side of the mountains. On the other side ("transmontane," the experts say) is the rest of the nation, held at bay by the Great Basin, and the Mojave and Colorado Deserts. Within the California Floristic Province, the proportion of endemic plants has been calculated at more than 47 percent.

Isolated at the edge of the continent by mountains and deserts, California is in many ways an island, a world unto itself. This distinction alone would have given the state a good chance to develop its unusual flora and fauna, but California's fortuitous location within the currents of Earth's atmosphere greatly magnified the probabilities. California's climate, perhaps even more than its terrain, sets the region apart.

The climatic regime is straightforward—winters are mild and wet; summers are warm and dry. So

what? This regime itself is rare. California is the *only* region in North America that exhibits this pattern, and it's one of only a handful worldwide: the Mediterranean region, Chile, southwestern South Africa, and westernmost Australia. (All of these areas harbor large numbers of endemic species.)

Things become interesting when, inevitably, the climate and topography interact. In winter, globe-circling winds drive Pacific storms onto the land; and where the storms meet the region's mountains, they drop their moisture, often in copious amounts. Parts of northern California receive as much as 120 inches of rainfall a year.

Summer is vastly different. The summer rainstorms that regularly moisten Oregon and Washington, and even sometimes drench Arizona and New Mexico, typically miss California altogether. From June to September most of the state desiccates under cloudless skies.

But different kinds of terrain are better at holding and releasing water. Further, some sites—deep canyons, north-facing slopes—receive less of the summer's relentless sunshine. Large areas, like those high in the Sierra Nevada, remain cool despite long exposure to intense solar radiation. Near the coast, summer fog and ocean breezes keep temperatures in the 60s and 70s, day and night, for months at a time. Other regions, such as Death Valley, may broil every day from April to October in temperatures of 100 degrees and up.

The end-product of the interaction between climate and topography is a staggering diversity of habitats—some continually and abundantly wet, some always dry; some freezing in winter and blazing in summer, others moderate and equable year-round. The habitats shift and intergrade in a dizzyingly complex patchwork.

The patchiness of the state's habitat matrix also is a product of time and Earth's history, which have formed and reformed the terrain. During the 150 million years in which California has existed as part of North America, the region's changing assemblages of plants and animals have been subjected to an intricate mix of influences: the rise and fall of sea level, the rapid growth and erosion of mountain ranges, the comings and goings of glaciers, the invasion and retreat of continental forests, the tectonic transport of whole chunks of the planet's surface, and the birth of numerous small pockets of unusual soils.

Accordingly, many of the state's present endemic organisms, plants especially, are stragglers—relicts, in biologic lingo—that once enjoyed much more widespread distributions (examples to come). Others are newcomers that have recently evolved to exploit narrow environmental conditions, such



Jeff Foot/Tam Stack & Assoc



John Gerlach

Their populations decimated by loss of habitat, members of this vulnerable trio have found havens on Conservancy preserves. The California clapper rail (top)—federally listed as endangered—practices the art of camouflage on Elkhorn Slough. Appropriately, the highest known densities of desert tortoise (a federally threatened species) are found on Desert Tortoise Preserve (above). Late spring finds Sand Ridge Preserve dotted with the vibrantly colored flowers of the beavertail cactus (right), a candidate for federal protection.



Jerry L. Ferreira



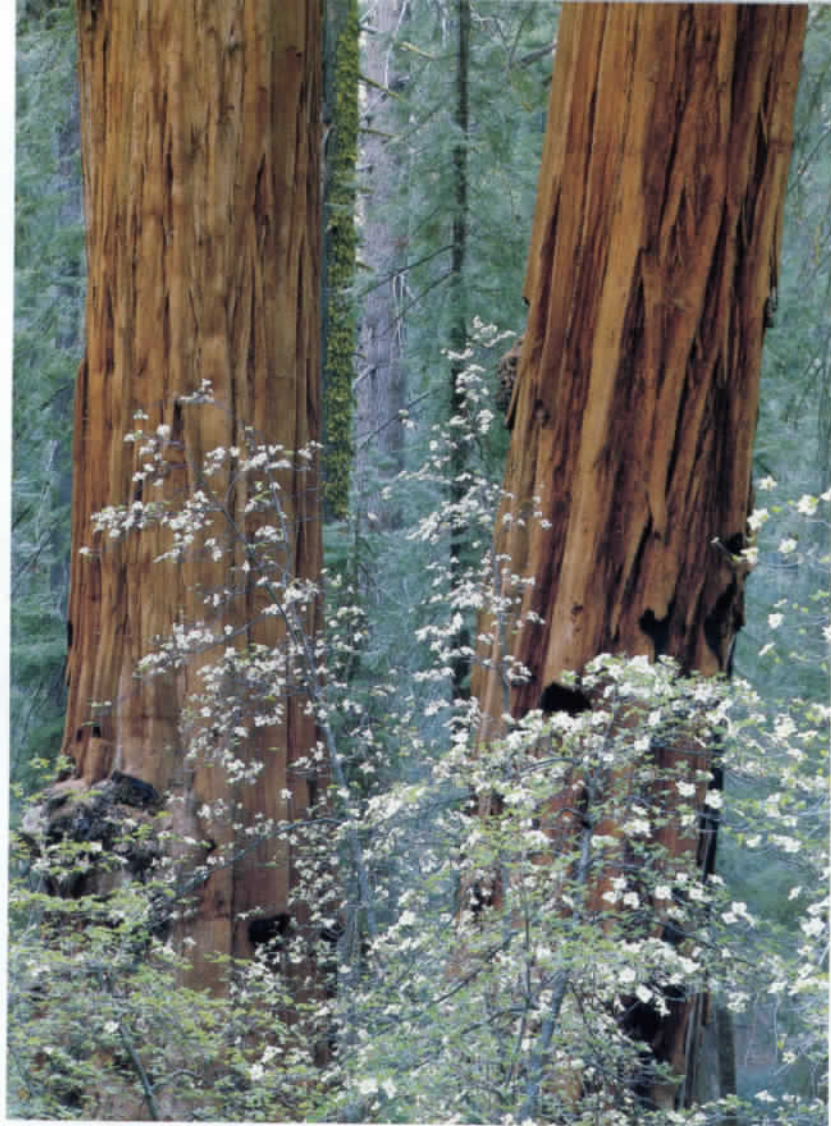
Ed Cooper

as the combination of severe summer drought and soils rich in toxic magnesium. In some cases, whole communities are distinctive—local chaparrals composed of endemic plants like manzanita (*Arctostaphylos myrtifolia*) and lone buckwheat (*Eriogonum apricum*).

CONE PEAK is not one of California's tallest mountains, but it has other virtues. It is the second highest peak in the Santa Lucia Mountains, a remote coastal range that forms the craggy backbone of the Big Sur region. Distributed in a loose

collar around Cone Peak's summit is a stand of distinctive spire-shaped firs, their drooping branches bristling with stout, glossy needles. These are Santa Lucia firs, *Abies bracteata*. The Cone Peak stand is small, just a couple of miles across, one of about half a dozen groves of similar size in the Santa Lucias. Except for scatterings of individuals surrounding the groves, this is it—the entire distribution of North America's rarest fir.

Cone Peak is also a remarkable biological vantage point. From the summit, looking 30 miles south along the Santa Lucia Range, one can see the upper



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Left: Thick coastal fog shrouds a grove of redwoods. Above: Sequoias dwarf a white dogwood. Both giant species symbolize the grandeur of California's natural heritage.

watershed of a tiny stream called Salmon Creek. Here on a north-facing slope is the southernmost redwood tree. From Salmon Creek all the way to Chetco Creek, just into Oregon 450 miles north, runs an intermittent strip of redwood forest—here thinning, there broadening, but always seaward of the crest of the coastal mountains. Within this band is the entire natural distribution of the coast redwood, *Sequoia sempervirens*. It is perhaps the nation's most revered tree, the tree with a national park all its own.

To the east, away from the coast, the view from

Cone Peak is wide and uninterrupted. So, in winter and spring when the air is clean and sharp, it's possible to look 200 miles straight across the state and into the mouth of Yosemite Valley. Here, too, is another of California's well-known endemics, a near relative of the coast redwood: the big tree or giant sequoia (*Sequoiadendron giganteum*). Its range is even more restricted. All of the native members of the species grow in about 75 groves centered in the low Sierra Nevada, ending in an isolated stand of half a dozen trees due west of Lake Tahoe.

These trees—the giant sequoia, coast redwood,

and Santa Lucia fir—are perhaps the most famous of California's endemic plant species. Fossil needles and cones found widely in North America and Asia tell us that the trees are all relict species, left behind in favorable locales after the ranges of their ancestors had shrunk with changing climate and topography.

FROM THE SHORE near Santa Barbara, Santa Cruz Island juts up as a tantalizing shape on the horizon, in clear weather its steep coastal ridges standing out as pleats in an otherwise featureless profile. From high above, as shown in satellite photos and maps, the island has the outline of a turkey dashing for its life: blunt tail in the west, plump body, stretched-out neck, cockscomb, wattle, and beak in the east.

California, despite the length of its coastline, doesn't have many islands—maybe just over a dozen. But among them all, Santa Cruz Island stands out. At 96 square miles, Santa Cruz Island is quite large enough to get lost on. Its topography is highly varied: a major fault cleaves the island through its core, and on either side of this big central valley are two distinct ranges of hills (they've been called mountains), one rising to 2,400 feet.

Cutting down through these hills are scores of winding canyons, some alive year-round with the sound of running water, others silent. And growing up through the canyons are thickets of coastal sage, coyote brush, deer brush, and willow all surrounded by broad, open grasslands. At intervals groves of round-crowned oaks and lanky pines stand out from the chaparral. It's along these margins that a visitor is likely to hear the rasping screech of the Santa Cruz Island scrub jay.

An inhabitant of western woodlands and chaparral margins, the usual scrub jay looks a bit like a cross between an eastern blue jay and a very small crow: although it has no crest, it has the jay's characteristic stout, powerful bill; its head, wings, and tail are a deep iridescent blue. On Santa Cruz Island the scrub jay is different. *Aphelocoma coerulescens insularis*, the subspecies endemic to the island, is significantly larger and bluer than its mainland counterpart, with a recognizably larger beak.

One of the scrub jay's roles, for whatever reason, is to comment loudly on the passage of other animals through its habitat. On Santa Cruz the jay often is heard shrieking after a diminutive gray-and-tan fox. The fox, too, is highly unusual. Gray foxes are common in wild California—that is, on the mainland. Offshore, six of California's eight Channel Islands harbor a related but distinct species, the island fox (*Urocyon littoralis*). And each of these islands supports a different subspecies. In the case of Santa Cruz, the fox is *Urocyon littoralis santacruzae*.

Both of these animals—the Santa Cruz Island fox and scrub jay—are excellent examples of endemism among California's animal populations. A great many others are found on California's islands as well as on the mainland: the island night lizard, restricted to three other islands but mysteriously absent from Santa Cruz; the yellow-billed magpie, a California endemic found mainly in the Great Central Valley; the salt marsh harvest mouse, confined to dwindling tidelands around San Francisco Bay; the blunt-nosed leopard lizard, now endangered following near-total agricultural conversion of its



Frans Lanting

An aerial view of Santa Cruz reveals the deep gouges, sharp ridges, and rocky hillsides that mark the island's dramatic coastline.

habitat in the southern San Joaquin Valley; and the red-bellied newt, isolated in the state's north coastal region. The list goes on.

How do these animals fit into the whole California picture? The state supports roughly 965 native vertebrates—540 birds, 77 reptiles, 47 amphibians, 214 mammals, 83 freshwater fishes, give or take a few in each category. Somewhere around 65 of these species live only in California.

"These are all full species, not subspecies," says Blair Csuti, a zoologist formerly with the Con-



Tupper Ansel Blake

Santa Cruz supports some varieties of life found nowhere else, such as the tiny Santa Cruz Island fox (left). Showy mounds of giant coreopsis (below) are more common, occurring both on the island and on the mainland.



Frans Lanting



Rod Planck/Tom Stack & Assoc.

servancy's Western Regional Office. "If you went into subspecies you'd have a lot of local endemics—almost any isolated valley would have some endemic subspecies." How many statewide? "The numbers get pretty squishy," Csuti says. "I don't know that anyone's ever tried to tally them all."

The numbers get squishy because not all species and subspecies are created equal. Scientific names reflect naturalists' attempts to document observed variation, but not all organisms have been treated similarly or studied at the same level of detail. Some classified as "full" distinct species are closely related and are known to have separated recently via minor genetic changes. On the other hand, some subspecies—like those of the California slender salamander—look nearly identical, yet at the molecular level are as different as robins and ostriches, a "genetic distance" that evolved over millions of years. Such a difference can be discerned only by biochemical analysis. Taxonomists are still struggling to work it all out.

For the rest of us, forced to accept the taxonomy as it stands, California's biotic richness is simply there to see on any walk in the wilds. And it is this see-it-yourself natural diversity—and not the polysyllabic names and the hyperbolic tallies—that has conservationists and land managers concerned. Since the discovery of gold, California has been growing fiercely: in 1985 the state's population reached 25.6 million, surpassing that of New York, the next most populous state, by nearly eight million residents.

Fortunately, the land itself is large. California covers as much area as New York, Ohio, and all the New England states combined. Unfortunately, *wild*



Tupper Ansel Blake

The Conservancy is helping to protect many of California's imperiled endemics such as blunt-nosed leopard lizards (top) on the Carrizo Plain and salt marsh harvest mice (above) at Elkhorn Slough.

California is shrinking. Since 1900, to give just one example, at least 65 percent of the state's coastal wetlands have been dredged, filled, or drained. Eliminated with the life-giving mud were the resident shorebirds, crabs, clams, fishes, and mammals. It is difficult to say how much of the state can no longer support its original communities of plants and animals—perhaps 25 percent or more. What



Scene on a Jepson Prairie vernal pool: a silhouetted flock is captured in reflected winter light.

Tupper Ansel Blake

can be said is that development pressures remain severe. Urban sprawl, agricultural expansion, logging, mining, energy development, and road building have diminished every type of habitat.

Although not one of the state's natural communities has yet been wiped out, some are only the breadth of a bulldozer's blade away from extinction. The riparian forests of the Great Central Valley, once covering hundreds of square miles, are now nearly gone. Of a community called southern coastal dune scrub, only 300 acres are left. Vernal pools and their unusual plant assemblages are endangered statewide. According to Robin Cox, an ecologist with the Conservancy's California Field Office, for some natural elements such as the southern coastal dune scrub "it's now possible for one catastrophe to eliminate all the remaining habitat."

Things have clearly reached a critical stage for natural diversity in the golden state. As Harvard biologist Edward O. Wilson warns, "The one

process ongoing in the 1980s that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive us."

For The Nature Conservancy's California Field Office, the challenge is self-evident: speed up the preservation of natural habitats or face up to the bitter possibility that elements of the state's ecological matrix will soon be lost, and wild California will dwindle piece by piece beyond recovery.

A native Californian, **Sheridan Warrick** is editor of *Pacific Discovery*, the quarterly magazine of the California Academy of Sciences, and managing editor of the Academy's scholarly *Proceedings* and *Occasional Papers*. He holds degrees in biology and environmental studies from the University of California, Santa Cruz, and is the author of several publications and popular articles on science and natural history.